(FILE 'USPAT' ENTERED AT 14:58:22 ON 18 AUG 1997)

```
L1         61739 S SOIL?
L2          9229 S L1 AND (LIMESTONE OR CALCIUM(W)CARBONATE OR LIME OR CALC
IUM
L3          2116 S L2 AND (ALUMINA OR ALUMINUM(W)OXIDE OR ALUMINIUM(W)OXIDE
 OR
L4           511 S L3 AND (IRON(2A)OXIDE? OR FERROUS(2A)OXIDE? OR FERRIC(2A
)OX
L5           239 S L4 AND (OXYGEN? OR AERATING OR AERATION OR AERATE)
L6            12 S L4 AND QUENCH
L7            30 S L4 AND QUENCH?
L8            22 S L7 AND (AMORPHOUS OR GLASSY OR GLASS)

=> d l7 1,4,5,7,8,18,24
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1. 5,575,827, Nov. 19, 1996, System for producing cementitious materials from ferrous blast furnace slags; Ronald R. Piniecki, 65/141, 19 :IMAGE AVAILABLE:

4. 5,374,309, Dec. 20, 1994, Process and system for producing cementitious materials from ferrous blast furnace slags; Ronald R. Piniecki, 106/714, 721, 739, 747, 789, 790 :IMAGE AVAILABLE:

5. 5,196,620, Mar. 23, 1993, Fixation and utilization of ash residue from the incineration of municipal solid waste; Frederick H. Gustin, et al., 588/257; 106/705; 405/128; 428/2, 404, 903.3; 588/252 :IMAGE AVAILABLE:

7. 5,180,421, Jan. 19, 1993, Method and apparatus for recovering useful products from waste streams; William Rostoker, deceased, et al., 75/414, 323, 759 :IMAGE AVAILABLE:

8. 5,134,944, Aug. 4, 1992, Processes and means for waste resources utilization; Leonard J. Keller, et al., 110/234; 48/DIG.2; 110/229, 233, 346; 122/1R, 2; 423/DIG.18; 588/261 :IMAGE AVAILABLE:

18. 4,514,307, Apr. 30, 1985, Method of stabilizing organic waste; Raymond Chestnut, et al., 588/200; 106/697, 708, 710, DIG.1; 210/908; 588/207, 252, 256 :IMAGE AVAILABLE:

24. 4,040,852, Aug. 9, 1977, Lightweight aggregate; Dennis A. Jones, 106/709, 705 :IMAGE AVAILABLE:

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     (FILE 'USPAT' ENTERED AT 14:58:22 ON 18 AUG 1997)
L1         61739 S SOIL?
L2          9229 S L1 AND (LIMESTONE OR CALCIUM(W)CARBONATE OR LIME OR CALC
IUM
L3          2116 S L2 AND (ALUMINA OR ALUMINUM(W)OXIDE OR ALUMINIUM(W)OXIDE
 OR
L4           511 S L3 AND (IRON(2A)OXIDE? OR FERROUS(2A)OXIDE? OR FERRIC(2A
)OX
L5           239 S L4 AND (OXYGEN? OR AERATING OR AERATION OR AERATE)
L6            12 S L4 AND QUENCH
L7            30 S L4 AND QUENCH?
L8            22 S L7 AND (AMORPHOUS OR GLASSY OR GLASS)
L9           151 S SOIL(W)REMEDIAT?
L10          176 S SOIL(A)REMEDIAT?
L11           30 S L10 AND (LIMESTONE OR CALCIUM(W)CARBONATE OR LIME OR CAL
CIU
L12            3 S L11 AND (ALUMINA OR ALUMINUM(W)OXIDE OR ALUMINIUM(W)OXID
E)
L13            2 S L12 AND (IRON(A)OXIDE? OR FERROUS(A)OXIDE OR FERRIC(A)OX
IDE

     FILE 'JPO' ENTERED AT 15:32:01 ON 18 AUG 1997
L14            0 S L7
L15            0 S L10

     FILE 'EPO' ENTERED AT 15:32:35 ON 18 AUG 1997
L16            0 S L7
L17           35 S L10
L18          122 S SOIL(W)STABILIZ? OR SOIL(A)REMEDIAT?
L19            2 S L18 AND (AMORPHOUS OR GLASS)

     FILE 'USPAT' ENTERED AT 15:39:56 ON 18 AUG 1997
L20          137 S L19

=> d l20 20,51,95
```

20. 5,539,140, Jul. 23, 1996, Method for obtaining a geopolymeric binder allowing to stabilize, solidify and consolidate toxic or waste materials; Joseph Davidovits, 588/3; 106/607, 624; 588/9, 10 :IMAGE AVAILABLE:

51. 5,181,795, Jan. 26, 1993, In-situ landfill pyrolysis, remediation and vitrification; Louis J. Circeo, Jr., et al., 405/128, 131, 258 :IMAGE AVAILABLE:

95. 4,376,598, Mar. 15, 1983, In-situ vitrification of soil; Richard A. Brouns, et al., 588/253; 175/16; 299/14; 404/79; 405/129, 131, 258 :IMAGE AVAILABLE:

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     (FILE 'USPAT' ENTERED AT 14:58:22 ON 18 AUG 1997)
L1         61739 S SOIL?
L2          9229 S L1 AND (LIMESTONE OR CALCIUM(W)CARBONATE OR LIME OR CALC
IUM
L3          2116 S L2 AND (ALUMINA OR ALUMINUM(W)OXIDE OR ALUMINIUM(W)OXIDE
 OR
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)OX
L5           239 S L4 AND (OXYGEN? OR AERATING OR AERATION OR AERATE)
L6            12 S L4 AND QUENCH
L7            30 S L4 AND QUENCH?
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CIU
L12            3 S L11 AND (ALUMINA OR ALUMINUM(W)OXIDE OR ALUMINIUM(W)OXID
E)
L13            2 S L12 AND (IRON(A)OXIDE? OR FERROUS(A)OXIDE OR FERRIC(A)OX
IDE

     FILE 'JPO' ENTERED AT 15:32:01 ON 18 AUG 1997
L14            0 S L7
L15            0 S L10

     FILE 'EPO' ENTERED AT 15:32:35 ON 18 AUG 1997
L16            0 S L7
L17           35 S L10
L18          122 S SOIL(W)STABILIZ? OR SOIL(A)REMEDIAT?
L19            2 S L18 AND (AMORPHOUS OR GLASS)

     FILE 'USPAT' ENTERED AT 15:39:56 ON 18 AUG 1997
L20          137 S L19
L21           26 S L18 AND (VITREOUS OR VITRIF?)

=> d l21 19

19. 5,024,556, Jun. 18, 1991, System for enhanced destruction of
hazardous wastes by in situ vitrification of soil; Craig L.
Timmerman, 405/128, 129, 258 :IMAGE AVAILABLE:
```

US004764487A Aug. 16, 1988 L6: 2 of 2

High iron **glass** composition

INVENTOR: LEWIS, ALBERT (US)
APPLICANT: GLASS INT INC (US)
APPL NO: US 76241185
DATE FILED: Aug. 5, 1985
PRIOR-AP: US 76241185A Aug. 5, 1985
EUR-CL: C03C1/00; C03C13/00

ABSTRACT:

An improved **glass** composition, especially suitable for **glass** fiber manufacture having good fiberizing characteristics and good physical properties, and containing typically 40.0% to 65.0% **silica**, 4.0% to 11.0% **aluminum oxide**, 6.0% to 20.0% sodium oxide, 5.0% to 8.0% magnesium oxide and 6.0% to 17.0% **calcium oxide**, 4.0% to 12.0% ferric and **ferrous oxide**, and 0.0% to 7.0% potassium oxide.

FILE COPY

FILE 'CA' ENTERED AT 16:05:01 ON 18 AUG 1997
L1 1682 S SOIL(2A)REMEDIAT?
L2 38 S L1 AND (GLASS OR GLASSY OR QUENCH OR VITRIF? OR VITREOU

=> d 12 5,26,28 all

L2 ANSWER 5 OF 38 CA COPYRIGHT 1997 ACS
AN 126:103562 CA
TI Aggregates for construction from **vitrified** chromium contaminated soils
AU Meegoda, Jay N.; Kamolpornwijit, W.; Vaccari, David A.; Ezeldin, A. Samer; Walden, Laina; Ward, William A.; Mueller, Robert T.; Santora, Scott
CS New Jersey Institute Technology, Newark, NJ, 07102, USA
SO Environ. Geotechnol., Proc. Int. Symp., 3rd (1996), Volume 1, 405-415. Editor(s): Fang, Hsai-Yang; Inyang, Hilary I. Publisher: Technomic, Lancaster, Pa.
CODEN: 63YLAC
DT Conference
LA English
CC 19-9 (Fertilizers, Soils, and Plant Nutrition)
AB A feasibility study was performed to **remediate** chromium contaminated **soil** by ex-situ **vitrification** and to evaluate reuse potential of **vitrified** products as highway construction aggregate. Several phys. and chem. tests were conducted on soil samples collected from nine chromium contaminated sites. Results were analyzed for their suitability for **vitrification**. Sand and carbon were added to ensure **vitrification** and redn. Approx. 2.5 kg of each soil was **vitrified** and the resulting **vitrified** product was subjected to addnl. chem. and phys. tests. The toxicity characteristic leaching procedure (TCLP) test results on chromium concn. suggest successful remediation. The phys. properties of **vitrified** soils were better than the NJDOT (New Jersey Department of Transportation) specifications for aggregates suggesting the use as a construction material.
ST chromium pollution **soil remediation** **vitrification**
IT Soil aggregates
(aggregates for construction from **vitrified** chromium contaminated soils)
IT Soil reclamation
(**vitrification**; aggregates for construction from **vitrified** chromium contaminated soils)
IT 7440-47-3, Chromium, occurrence
RL: POL (Pollutant); OCCU (Occurrence)
(aggregates for construction from **vitrified** chromium contaminated soils)

L2 ANSWER 26 OF 38 CA COPYRIGHT 1997 ACS
AN 119:55289 CA
TI Plasma treatment of INEL soil contaminated with heavy metals
AU Detering, B. A.; Batdorf, J. A.
CS EG and G Idaho Inc., Idaho Falls, ID, USA
SO Report (1992), EGG-WTD-9925; Order No. DE92012372, 41 pp. Avail.: NTIS
From: Energy Res. Abstr. 1992, 17(7), Abstr. No. 17995

DT Report
LA English
CC 60-4 (Waste Treatment and Disposal)
Section cross-reference(s): 19, 69
AB Idaho National Engineering Lab. soil spiked with inorg. Cr, Pb, Hg, Ag, and Zn salts was melted in a 150 kW plasma furnace to produce a **glassy** slag product, an environmentally safe waste form. To reduce the melting temp. of the soil, $NaCO_3$ was added to half the test batches. Random samples for each batch of **glassy** slag product were analyzed for total metals concn. and metals leachability via the EPA toxicity characterization leaching procedure (TCLP) tests. These tests showed residual metals were very tightly bound to the slag matrix and were within EPA TCLP limits under these test conditions. SEM and emissions dispersive spectroscopy anal. of the **vitrified** soil also confirmed that added metals present in the **vitrified** soil were totally contained in the cryst. phase as distinct oxide crystallites.
ST heavy metal **soil** pollution **remediation**; plasma furnace **vitrification soil** pollution **remediation**; leachability heavy metal **vitrified** soil slag
IT Soil pollution
(by heavy metals, remediation of, by plasma furnace **vitrification**, at Idaho National Engineering Lab., Idaho)
IT Leaching
(of heavy metals, from **vitrified glass** slag, detn. of, by EPA toxicity characterization test, at Idaho National Engineering Lab., Idaho)
IT Waste solids
(contaminated soils, remediation of, by plasma furnace **vitrification**, at Idaho National Engineering Lab., Idaho)
IT Metals, biological studies
RL: BIOL (Biological study)
(heavy, **soil** pollution by, **remediation** of, by plasma furnace **vitrification**, at Idaho National Engineering Lab., Idaho)
IT Furnaces, electric
(induction, plasma, remediation of heavy metals-polluted soils by **vitrification** with, at Idaho National Engineering Lab., Idaho)
IT 7439-92-1, Lead, biological studies 7439-97-6, Mercury, biological studies 7440-22-4, Silver, biological studies 7440-47-3, Chromium, biological studies 7440-66-6, Zinc, biological studies
RL: BIOL (Biological study)
(**soil** pollution by, **remediation** of, by plasma furnace **vitrification**, at Idaho National Engineering Lab., Idaho)

L2 ANSWER 28 OF 38 CA COPYRIGHT 1997 ACS
AN 118:260475 CA
TI **Vitrification** of contaminated soils
AU McNeill, K. R.; Waring, S.
CS VERT Ltd., Leeds, LS1 1HQ, UK
SO Contam. Land Treat. Technol., [Pap. Int. Conf.] (1992), 143-59.
Editor(s): Rees, John F. Publisher: Elsevier, London, UK.
CODEN: 58WMAT
DT Conference
LA English
CC 60-5 (Waste Treatment and Disposal)
Section cross-reference(s): 19, 59
AB The principles and application of the VERT **vitrification** process in the ex situ remediation of polluted soils in the UK are presented. Results of full scale process trials and a description of the tech. to be used in the first UK com. soil

vitrification plant are also given.

ST **vitrification remediation soil** pollution UK; heavy metal **soil** pollution **vitrification remediation**; asbestos **soil** pollution **vitrification remediation**; leaching heavy metal **vitrified** soil UK; air pollution **vitrification** polluted soil UK

IT Soil pollution
(by asbestos and heavy metals, remediation of, by ex situ **vitrification**, at St. Mary's Island, UK)

IT Air pollution
(by particulates and flue gases and asbestos, from ex situ **vitrification** furnace, design of control measures in relation to)

IT Particles
(heavy metal-contg., air pollution by, from **vitrification** furnace flue gases)

IT Leaching
(of heavy metals and asbestos, from **vitrified** soils, extn. procedure toxicity test for)

IT Asbestos
RL: PROC (Process)
(**soil** pollution by, **remediation** of, by ex situ **vitrification**, at St. Mary's Island, UK)

IT Flue gases
(**vitrification** furnace, heavy metals and particulates and asbestos fibers in, air pollution by)

IT Metals, biological studies
RL: PROC (Process)
(heavy, **soil** pollution by, **remediation** of, by ex situ **vitrification**, at St. Mary's Island, UK)

IT 124-38-9, Carbon dioxide, biological studies 630-08-0, Carbon monoxide, biological studies 7446-09-5, Sulfur dioxide, biological studies 7647-01-0, Hydrogen chloride, biological studies
RL: POL (Pollutant); OCCU (Occurrence)
(air pollution by, from **vitrification** furnace flue gases)

IT 7439-89-6P, Iron, reactions 7439-96-5P, Manganese, reactions 7439-97-6P, Mercury, reactions 7440-21-3P, Silicon, reactions 7440-23-5P, Sodium, reactions 7440-24-6P, Strontium, reactions 7440-31-5P, Tin, reactions 7440-39-3P, Barium, reactions 7440-42-8P, Boron, reactions 7440-43-9P, Cadmium, reactions 7440-50-8P, Copper, reactions 7440-66-6P, Zinc, reactions 7440-70-2P, Calcium, reactions 7704-34-9P, Sulfur, reactions
RL: PREP (Preparation); RCT (Reactant)
(leaching of, from **vitrified** soil, extn. procedure toxicity test for)

L10 ANSWER 21 OF 21 WPIDS COPYRIGHT 1997 DERWENT INFORMATION LTD
AN 71-12728S [07] WPIDS
TI **Soil** stabilisation process.
DC L02 M24 Q42
PA (YAWA) SHIN NIPPON IRON AND STEE
CYC 1
PI JP 46005747 B (7107)*
PRAI JP 68-67243 680919
IC E02D000-00
AB JP71005747 B UPAB: 930831
Process comprises mixing 30 to 70 pbw of a mixture consisting of 65 to 95 wt.% (excluding adhered water) of rapidly cooled blast furnace slag having a particle size distribution of >70% of over 0.6 mm sieve and <5% of over 5 mm sieve, and 35 to 5 wt.% of alkaline agent with 70 to 30 wt. parts of treated **soil**. The blast furnace slag used in this invention is prepd. by rapid cooling of molten slag discharged from a blast furnace at a temperature of ca. 1500 degrees C using large amount of water, steam or compressed air, allowing slag to **vitrify**. Preferred alkaline agents are slaked **lime**, caustic **lime**, or blast furnace slag